WHAT IS CLAIMED IS:

1. A self-lubricating internal combustion engine comprising:

an engine ring constructed of two concentric rings, one being an outer engine ring and an other being an inner engine ring, each ring of said two concentric rings having a C-shaped cross-section having a first seam edge, a second seam edge, and an engine ring wall therebetween, wherein said first seam edge of said outer engine ring is sealable with said first seam edge of said inner engine ring, and said second seam edge of said outer engine ring is correspondingly sealable with said second seam edge of said inner engine ring so as to form a torus having an engine-ring cross-section bounded by said engine ring wall of said outer engine ring and by said engine ring wall of said inner engine ring, said engine ring wall of said outer engine ring having an outer ring diameter and said engine ring wall of said inner engine ring having an inner ring diameter that is smaller than said outer ring diameter;

a plurality of pistons that includes a plurality of intake-valve pistons and a plurality of exhaust-valve pistons; wherein said plurality of intake-valve pistons are fixedly connected to a first one of said two concentric rings, said plurality of intake-valve pistons being spaced apart from each other; wherein said plurality of exhaust-valve pistons are fixedly connected to a second one of said two concentric rings, said plurality of exhaust-valve pistons being spaced apart from each other; wherein each piston of said plurality of pistons has a piston body with a piston face at each end of said piston body, said piston body having a cross-section that is slidably and sealably movable in said engine ring, and wherein a first face of a first intake-valve piston and a first face of a first exhaust-valve piston form boundaries for a chamber, wherein, when combustion occurs in said chamber, combustion forces applied to said first intake-valve piston and to said first exhaust-valve piston force said first one and said second one of said two concentric rings to counterrotate, thereby increasing a volume of said chamber and decreasing a volume of an adjacent chamber;

a plurality of gas flow valves; wherein said plurality of gas flow valves corresponds in number to said plurality of pistons, and wherein said plurality of gas flow valves includes an intake valve and an exhaust valve;

an intake manifold;

an exhaust manifold; and

and a cooling system for cooling said engine ring, said cooling system including an air-cooling system and excluding an oil-lubrication-and-cooling system;

wherein a gas flow valve of said plurality of gas flow valves is assembled on each piston of said plurality of pistons, said intake valve being assembled directly on said intake-valve piston and said exhaust valve being assembled on said exhaust-valve piston;

wherein said intake valve is gas-flowably connected to said intake manifold so as to control air flow from said intake manifold through said intake-valve piston into said engine ring, and said exhaust valve is gas-flowably connected to said exhaust manifold so as to allow control exhaust-gas flow from said engine ring through said exhaust-valve piston into said exhaust manifold;

wherein said engine ring and said plurality of pistons are constructed of carbon-reinforced-carbon material.

2. An internal combustion engine comprising:

an engine ring constructed of two concentric rings, one being an outer engine ring and an other being an inner engine ring, each ring of said two concentric rings having a C-shaped cross-section having a first seam edge, a second seam edge, and an engine ring wall therebetween, wherein said first seam edge of said outer engine ring is sealable with said first seam edge of said inner engine ring, and said second seam edge of said outer engine ring is correspondingly sealable with said second seam edge of said inner engine ring so as to form a torus having an outer circumferential engine wall of a first ring diameter formed by said engine ring wall of said outer engine ring, and

an inner circumferential engine wall of a second ring diameter formed by said engine ring wall of said inner engine ring, said first ring diameter being greater than said second ring diameter;

a piston; and

a gas flow valve.

3. The internal combustion engine of claim 2, wherein said engine ring has a torus cross-section and said piston has a piston body with a piston face, and wherein said piston body is formed to fit within said torus cross-section.

4. The internal combustion engine of claim 3, wherein said piston includes a plurality of pistons, said plurality of pistons including an intake-valve piston and an exhaust-valve piston that are slidably assembled within said torus so as to form a chamber between said intake-valve piston and said exhaust-valve piston.

5. The internal combustion engine of claim 4, wherein said gas flow valve is assembled on said piston, and wherein said gas flow valve on said intake-valve piston is an intake valve and on said exhaust-valve piston is an exhaust valve, and wherein gas flow through said engine ring comprises air flow into said chamber through said air intake valve and exhaust flow from said chamber through said exhaust valve.

6. The internal combustion engine of claim 5, wherein said chamber includes a plurality of chambers and said intake-valve piston includes a plurality of intake-valve pistons and said exhaust-valve piston includes a plurality of exhaust-valve pistons, said plurality of exhaust-valve pistons being equal in number to said plurality of intake-valve pistons;

wherein said plurality of intake-valve pistons are fixedly attached to a first concentric ring of said two concentric rings and fixedly spaced apart relative to one another, and wherein said plurality of exhaust-valve pistons are fixedly attached to a second concentric ring of said two concentric rings and fixedly spaced apart relative to

one another, said intake-valve pistons and said exhaust-valve pistons being alternately arranged within said engine ring such that each chamber of said plurality of chambers is bounded by one of said intake-valve pistons and one of said exhaust-valve pistons.

7. The internal combustion engine of claim 6, wherein said engine is operable in a mode having a combustion stroke, and wherein said plurality of chambers includes at least one combustion chamber;

wherein, under force exerted by said combustion stroke in said combustion chamber on said one of said intake-valve pistons and said one of said exhaust-valve pistons, said plurality of intake-valve pistons and said plurality of exhaust-valve pistons are forced to move in opposite directions, such that said intake-valve pistons that are fixedly attached to said first concentric ring force said first concentric ring to rotate in a first direction while slidably moving in said second concentric ring, and said exhaust-valve pistons that are fixedly attached to said second concentric ring force said second concentric ring to rotate in a second direction while slidably moving in said first concentric ring, thereby forcing said combustion chamber to increase in volume and a second chamber that is adjacent to said combustion chamber to decrease in volume.

8. The internal combustion engine of claim 7, wherein said combustion chamber includes at least two combustion chambers and said combustion stroke takes place simultaneously in said at least two combustion chambers, and wherein said at least two combustion chambers are spaced equidistant from each other around said engine ring.

9. The internal combustion engine of claim 8, wherein said at least two combustion chambers includes two combustion chambers that are spaced 180 degrees apart from each other.

10. The internal combustion engine of claim 8, wherein said at least two combustion chambers includes three combustion chambers that are spaced 120 degrees apart from each other.

11. The internal combustion engine of claim 5, wherein said gas flow valve is actuated independently of mechanical action of said engine.

12. The internal combustion engine of claim 11, wherein said gas flow valve is a slider valve.

13. The internal combustion engine of claim 5, wherein said gas flow valve is mounted on said piston face.

14. The internal combustion engine of claim 2, wherein material for fabrication of said engine includes a low-expansion material with self-lubricating properties and a low coefficient of thermal expansion.

15. The internal combustion engine of claim 14, wherein said low-expansion material is coated with an insulating and non-oxidizing coating.

16. The internal combustion engine of claim 15, wherein said coating is silicon carbide.

17. The internal combustion engine of claim 14, wherein said low-expansion material is a carbon reinforced-carbon material.

18. The internal combustion engine of claim 2, wherein said engine ring has a self-sealing ring seam that seals said outer engine ring and said inner engine ring.

19. The internal combustion engine of claim 18, wherein said outer engine ring and said inner engine ring each have a seam edge, and wherein said seam edge of said outer engine ring mates with said seam edge of said inner engine ring so as to form an overlapping seam that seals against gas leakage when combustion force is applied against said seam.

20. The internal combustion engine of claim 2 further comprising an engine ring seal that fits between said first seam edge of said first concentric ring and said second concentric ring.

21. The internal combustion engine of claim 4 further comprising an intake manifold and an exhaust manifold, wherein said intake-valve piston is connected with said intake manifold so as to allow air to flow from said intake manifold through said intake-valve piston into said engine ring, and said exhaust-valve piston is connected with said exhaust manifold so as to allow exhaust gas to flow from said engine ring through said exhaust-valve piston into said exhaust manifold.

22. The internal combustion engine of claim 21, wherein said engine ring is mountable on a shaft that is insertable through an opening formed by said inner circumferential wall of said inner engine ring.

23. The internal combustion engine of claim 22, wherein said intake manifold and said exhaust manifold are mountable on said shaft.

24. The internation combustion engine of claim 7, wherein said engine ring rotates through an angle of rotation that is fluid-dynamically controlled and not mechanically constricted.

25. The internal combustion engine of claim 4 further comprising a spark plug, wherein said engine ring is operable in a spark-ignition mode and said spark plug is mounted in said piston face of said intake-valve piston.

26. The internal combustion engine of claim 2 further comprising an engine ring gear set that links said first concentric ring and said second concentric so as to allow equal but opposite rotation of each of said concentric rings.

27. The internal combustion engine of claim 4, wherein said piston has a length dimension that extends in a direction of rotation of said piston in said engine ring, and wherein said length dimension of said intake-valve piston differs from said length dimension of said exhaust-valve piston.

28. The internal combustion engine of claim 2 further comprising an air-cooling system and excluding an oil-lubrication-and-cooling system.